

### **REMARKS/ARGUMENTS**

Claims 1-16, 19 and 20 were pending at the time of the mailing of the outstanding Office Action. By this amendment, claim 1, 5-9, 15 and 16 have been cancelled without prejudice or disclaimer. New claims 21-30 have been added. No claims have been amended. In response to an objection to the specification, the specification has been amended to correct a spelling error on page 2.

In the Office Action of July 27, 2007, the Examiner rejected claims 1, 5-9, 15, 16, 19 and 20 under 35 U.S.C. § 102(b), as anticipated by, or in the alternative under 35 U.S.C. § 103(a), as obvious over US Pat. No. 4,327,145 to Mitani et al. (hereinafter "Mitani"). Claims 1, 5-9, and 15, 16, 19 and 20 stand rejected under 35 U.S.C. § 102(b), as anticipated by, or in the alternative under 35 U.S.C. § 103(a), as obvious over US Pat. No. 3,429,950 to Parker et al. (hereinafter "Parker I"). Claims 1, 5-9, 15, 16, 19 and 20 stand rejected under 35 U.S.C. § 103(a), as obvious over Parker I in view of US Pat. No. 3,300,544 to Parker et al. (hereinafter "Parker II") or JP54120675 or JP 401251791. The Examiner rejected claims 1-16, 19 and 20 under 35 U.S.C. § 103(a), as obvious over Mitani or Parker I in view of US Pat. No. 6,063,864 to Mathur et al. (hereinafter "Mathur") or JP54120675.

Claims 1, 5-9, 15, and 16 have been cancelled without prejudice or disclaimer of the subject matter contained therein. Therefore, the previous rejections of these claims are believed to be moot and are not further addressed herein.

The Examiner maintains that the recitation of "consisting essentially of" in claims 19 and 20 does not overcome the rejection based on Mitani. The Examiner maintains that the Applicants bear the burden of showing that the introduction of additional components would materially change the properties of the composition. The Examiner further alleges that the Applicants have not shown any novel characteristics of such a composition. However, as stated previously, the specification provides clear advantages of molding

compounds without thickening agents such as metal oxides. The presence of such agents can lead to high variability of product, the introduction of undesired moisture and resulting creation of unwanted chemical reactions during molding, and the possibility of a non-isotropic molded material due to flow of the molding compound. These drawbacks are fully provided on pages 1 and 2 of the specification.

Additionally, one of ordinary skill in the art would recognize that the addition of other thermoplastic components would *de facto* alter the properties of the final product or performance of the method. For example, the inclusion of isocyanates, as in Mitani, carries with it certain hazards. As indicated by the U.S. Department of Labor, Occupational Safety and Health Administration publication, attached as Appendix A, isocyanates are irritants to the skin and mucous membranes and include compounds which are suspected human carcinogens. On this basis alone, the use of isocyanates is undesirable. Additionally, one of ordinary skill in the art would also recognize that the addition of isocyanates into a composition as claimed would have distinct physical properties compared to a similar composition that was devoid of isocyanates. Furthermore, the omission of additional components such as isocyanates provides for a simplified preparation of sheet molding compounds. Therefore, the omission of such compounds, as in claims 19-26, provides basic characteristics of the claimed composition that are novel over Mitani. The Applicants accordingly maintain that claims 19-26 patentably distinguish over Mitani.

Claims 19 and 20 stand rejected under 35 U.S.C. § 102(b), as anticipated by, or in the alternative under 35 U.S.C. § 103(a), as obvious over Parker I. Parker I provides a B-stage polyester through the use of a precise amount of "a specific class of quinone modifiers," dialkyl p-benzoquinones (column 2, lines 38-46). Claims 19-26 require the omission of additional components in the molding composition, including such "quinone modifiers" and therefore, recite a simplified and novel composition over that disclosed by Parker I. Therefore, the present claims are not anticipated by Parker I.

Claims 19-26 are also non-obvious in view of Parker I. Under *Graham v. John Deere Co.*, an obviousness determination under 35 U.S.C. 103 requires analysis of 4 factors:

- (A) Determining the scope and contents of the prior art;
- (B) Ascertaining the differences between the prior art and the claims in issue;
- (C) Resolving the level of ordinary skill in the pertinent art; and
- (D) Evaluating evidence of secondary considerations.

Additionally, when applying 35 U.S.C. 103, the following tenets of patent law must be adhered to:

- (A) The claimed invention must be considered as a whole;
- (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;
- (C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and
- (D) Reasonable expectation of success is the standard with which obviousness is determined.

(MPEP § 2141, *quoting Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).)

Parker I provides no suggestion that the omission of such “quinone modifiers” is possible. To the contrary, Parker I indicates that it is the presence of specific modifiers in a precise quantity that makes it possible to create a B-staged polyester/monomer product (Abstract). The claimed invention provides a stable B-staged molding composition without the use of “modifiers” such as dialkyl p-benzoquinones. Additionally, the lapse of 33 years between the issuance of Parker I and the earliest priority date of the present application further demonstrates that the claimed invention is not obvious in view of Parker I. Withdrawal of the rejections under Parker I is respectfully requested.

The Examiner also rejected claims 19 and 20 under 35 U.S.C. § 103(a), as obvious over Parker I in view of Parker II or JP54120675 or JP 401251791. As with Parker I, discussed above, Parker II does not teach or suggest a molding composition consisting essentially of at least one unsaturated oligomer resin, at least one unsaturated monomer and optionally, at least one free radical initiator. While Parker I provides the use of dialkyl p-benzoquinones to produce a b-staged polyester, Parker II provides 1,4-naphthoquinone as a “polymerization modifier” for that purpose.

Neither Parker I nor Parker II provide any suggestion that the omission of such “modifiers” is possible. As mentioned above, Parker I indicates that it is the presence of specific dialkyl p-benzoquinone modifiers in a precise quantity that makes it possible to create a B-staged polyester/monomer product. Parker II indicates that only the use of 1,4 naphthoquinone as a polymerization modifier provides a suitable B-staged polyester. The use of other quinones, including the “closely related compound 1,2-naphthoquinone” provides unsatisfactory results (column 6, lines 68-74). The claimed invention provides a stable B-staged molding composition without the use of “modifiers” such as dialkyl p-benzoquinones or 1,4-naphthoquinone. Additionally, the lapse of time between Parker II and the present invention (35 years) is even greater than that between the issuance of Parker I and the earliest priority date of the present application, further demonstrating that the claimed invention is not obvious in view of Parker I in light of Parker II.

The translation of the abstract of JP 54120675 provides an epoxy prepreg laminated to an unsaturated polyester layer. If the abbreviations used in the translation are fully understood, the polyester comprises 100 parts by weight of an unsaturated polyester resin, 5-50 parts of a crosslinking agent, 0-2 parts of a light polymerization initiator, 1-100 parts of a thermal polymerization initiator, 0.01-1 part of a thermal polymerization inhibitor, 0-500 parts of filler(s) and 0-500 parts of reinforcing materials. As with Parker I and Parker II, JP 54120675 does not teach or suggest a polyester consisting essentially of at least one unsaturated oligomer resin, at least one unsaturated monomer and optionally, at least one free radical initiator. The presence of 5-50 parts of a “crosslinking

agent” makes the disclosure of JP 54120675 similar to those of Parker I and Parker II. Therefore, JP 54120675 does not support a finding of obviousness of the claimed invention in combination with Parker I.

The translation of the abstract of JP 401251791 provides a wiring board that is made by using three different resins: an epoxy, a melamine and an unsaturated polyester. Again, if the abbreviations used in the translation of the abstract of are fully understood, the composition comprises 10~50 parts by weight epoxy resin having a molecular weight of 5,000 or more, 5~25 parts by weight alkylmelamine resin, 5~50 parts by weight saturated polyester. It should be noted that JP 401251791 calls for the presence of a saturated polyester, not an unsaturated polyester, as recited in the claims. Additionally, the presence of an epoxy resin and an alkylmelamine resin with the saturated polyester, which are dissolved in a mixed solvent and cured, also distinguish JP 401251791 from the present invention. One of skill in the art would not have found a teaching or suggestion of B-staged polyesters from the teaching of a B-staged epoxy/melamine/polyester combination. Therefore, JP 401251791 also does not support a finding of obviousness of the claimed invention in combination with Parker I.

For the reasons set forth above, the Applicants maintain that claims 19-26 patentably distinguish over Parker I in view of Parker II or JP54120675 or JP 401251791. Withdrawal of this rejection under 35 U.S.C. § 103(a) is respectfully requested.

Claims 2-4, 10-14, 19 and 20 stand rejected under 35 U.S.C. § 103(a), as obvious over Mitani or Parker I in view of Mathur or JP54120675. As provided above, neither Mitani nor Parker I nor JP 54120675 teach or suggest the molding composition recited in claims 19-26. In reviewing the scope and contents of Mathur, it is observed that all of Mathur’s examples additionally contain “100 ppm of hydroquinone as a stabilizer” (column 4, lines 45-46). Therefore, Mathur’s disclosure is similar to Parker I’s disclosure in terms of the content of the composition. Additionally, Mathur also does not provide a stable, partially cross-linked compound as recited in the claims. Mathur instead provides

heat, UV irradiation and electron beam polymerization methods in connection with complete polymerization and crosslinking. Therefore, because none of the cited references teach or suggest a stable, partially crosslinked polyester of the claimed composition, claims 19-26 also patentably distinguish over Mitani or Parker I in view of Mathur or JP54120675.

Claims 2-4 and 10-14 also stand rejected under 35 U.S.C. § 103(a), as obvious over Mitani in view of Mathur or Parker I or JP54120675. The methods recited in these claims are neither taught nor suggested by the cited references. Claim 2 recites a method of making a thickened compound comprising preparing a composition consisting essentially of at least one unsaturated oligomer resin, and at least one unsaturated monomer; and non-reversibly, partially crosslinking the composition a predetermined amount by irradiation to provide a stable, partially crosslinked composition, wherein the viscosity of said composition is increased and further wherein the partially crosslinked composition is capable of being further crosslinked.

As provided above, Mitani requires the presence of isocyanates in the molding composition. Mathur and Parker I require the presence of quinones such as dialkyl p-benzoquinones as modifiers to create a polymerized polyester. Additionally, JP 54120675 calls for the presence of 5-50 parts of a "crosslinking agent." Therefore, none of these cited references teach or suggest all the limitations of claim 2. Withdrawal of the rejection of claims 2 and 10-14 is respectfully requested.

The method recited by claim 3 also patentably distinguishes over the cited prior art. Claim 3 recites, "A method of non-reversibly crosslinking a compound comprising: preparing a composition comprising an amount of unsaturated oligomer resin, an amount of unsaturated monomer, and an amount of a free radical initiator; and irradiating the composition with high-energy electrons, wherein a plurality of non-reversible crosslinks are formed, and wherein formation of said crosslinks is dependent upon an absorbed dose and a dose rate of said high-energy electrons and the dose and dose rate are selected to

provide a non-reversibly, partially crosslinked compound. None of the cited references teach or suggest such a method. As mentioned above, Mitani and Parker I do not teach or suggest the use of irradiation to polymerize a polyester. While Mathur discloses the use of irradiation to cure a polyester, Mathur provides no teaching or suggestion of doing so to create a B-stage polymer. Additionally, given the requirements of Mitani, Parker I and JP 54120675 for a specific component to successfully obtain a polymer, one of skill in the art would find no teaching or suggestion to combine the teachings of these cited references to arrive at the present invention. One of ordinary skill in the art would also have had no reasonable expectation of success in making such a combination. Therefore, claim 3, and claims 27 and 28 which depend from and include all the limitations of claim 3, patentably distinguish over the cited prior art.

Claim 4 recites a method of preparing a compound which is suitable for use in compression molding operations comprising preparing a thermoset mixture consisting essentially of an unsaturated oligomer resin, an unsaturated monomer, and a free radical initiator, forming a partially crosslinked mixture by selectively irradiating at least a portion of said thermoset mixture to a desired increased viscosity, placing said partially crosslinked mixture into a mold, and heating said mold to a temperature sufficient to convert said partially crosslinked mixture to a cured and a molded product. As mentioned above, Mitani requires the presence of isocyanates in the molding composition. Mathur and Parker I require the presence of quinones such as dialkyl p-benzoquinones as modifiers to create a polymerized polyester. Additionally, JP 54120675 calls for the presence of 5-50 parts of a "crosslinking agent."

Furthermore, while Mathur discloses the use of irradiation to cure a polyester, Mathur provides no teaching or suggestion of doing so to create a desired increase in viscosity to provide a partially crosslinked mixture and heating the partially crosslinked mixture to create a fully cured and molded product. Additionally, given the requirements of Mitani, Parker I and JP 54120675 for a specific component to successfully obtain a polymer, one of skill in the art would find no teaching or suggestion to combine the

teachings of these references with Mathur to arrive at the present invention. Therefore, claim 4, and claims 29 and 30 which depend from and include all the limitations of claim 4, patentably distinguish over the cited prior art. Therefore, withdrawal of the rejection of these claims under 35 U.S.C. § 103(a) is respectfully requested.

The Applicants maintain that the pending claims patentably distinguish over the prior art and request the issuance of a Notice of Allowance.

The outstanding Office Action was mailed on July 25, 2007. The Examiner set a shortened statutory period for reply of 3 months from the mailing date. Therefore, no petition for an extension of time is believed to be required with the filing of this response. Nevertheless, the Applicants hereby make a conditional petition for an extension of time for response in the event that such a petition is required. The current amendments result in 4 independent claims and 20 total claims. The fees for three additional independent claims in excess of three were previously paid. No fees are believed to be due with this response. However, in the event that a fee for the filing of his response is insufficient, the Commissioner is authorized to charge any fee deficiency or to credit any overpayment to Deposit Account 15-0450.

Respectfully submitted,

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## Safety and Health Topics

# Isocyanates

Safety and  
Health Topics

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Isocyanates are compounds containing the isocyanate group (-NCO). They react with compounds containing alcohol (hydroxyl) groups to produce polyurethane polymers, which are components of polyurethane foams, thermoplastic elastomers, spandex fibers, and polyurethane paints. Isocyanates are the raw materials that make up all polyurethane products. Jobs that may involve exposure to isocyanates include painting, foam-blowing, and the manufacture of many Polyurethane products, such as chemicals, polyurethane foam, insulation materials, surface coatings, car seats, furniture, foam mattresses, under-carpet padding, packaging materials, shoes, laminated fabrics, polyurethane rubber, and adhesives, and during the thermal degradation of polyurethane products.

Health effects of isocyanate exposure include irritation of skin and mucous membranes, chest tightness, and difficult breathing. Isocyanates include compounds classified as potential human carcinogens and known to cause cancer in animals. The main effects of hazardous exposures are occupational asthma and other lung problems, as well as irritation of the eyes, nose, throat, and skin.

The following questions link to information relevant to isocyanates exposure in the workplace.



### **What OSHA standards apply?**

[Standards](#) | [Preambles to Final Rules](#) | [Standard Interpretations](#)



### **What are examples of hazards and possible solutions?**



### **Where can I find information on chemical sampling and analysis methods?**



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